

AI-DRIVEN ACCIDENT RECONSTRUCTION

Navigating Legal and Ethical Boundaries
in Insurance Claims Management

Introduction

The concept for this project was inspired by the increasing interest of insurance companies in the field of artificial intelligence. The objective of this article is to analyse a feasible business case from a legal and ethical standpoint. The assessment of road accidents is a critical component of insurance claims management. It requires detailed analysis to determine the dynamics of incidents and assign responsibility. The traditional methods based on photographic evidence and eyewitness accounts are often time-consuming. Advanced technologies such as artificial intelligence (AI) and 3D simulation provide innovative solutions to these challenges. They enable the integration of multiple data sources, including accident photos, historical records and telemetry from devices such as black boxes, to create detailed reconstructions. By enhancing visual comprehension and furnishing preliminary data-driven assessments, AI systems could generate 3D simulations that could enhance the accuracy of decision-making, provide an assessment of liability in claims and reduce litigation. This study examines the feasibility of using these technologies in compliance with legal and ethical requirements.

Case study analysis

In this section we will analyze in which category of risk traffic evaluation could fall and then we will proceed to investigate if the level of risk can be mitigated in some way.

Legal Aspect

Firstly, we analyze whether the project falls under the scope of Article 5, "Prohibited AI Practices." The current business model does not violate any fundamental rights, however, attention must be paid to Art. 5, comma 1, point C which concerns "Evaluation with the objective of social scoring." If the AI system accesses data beyond the insurance domain, such as traffic fines, this could lead to "unfavorable treatment [...] in social contexts (in this case insurance companies) that are unrelated to the context in which data was originally generated or collected (in this case police report)".

After this preliminary analysis, we can proceed to the analysis of the risk level of the system, according to the provisions of Art. 6 "Classification rules for high-risk AI systems" and Annex III. In the case of insurance companies, we are referring to "essential

private services” and therefore we refer to Annex III, comma 5, point A. This AI system can suggest the guilty part of a car accident and thus influence the judgement of the insurance expert that can “grant, reduce, revoke, or reclame of these such benefits and services” (in this case insurance services). For this reason the AI system falls in the high-risk category.

Because of the risk of the system we must fulfill the articles of the AI act for the mitigation of the risk. We want to enlighten the importance of the articles of the AI act in this business model context. In Art. 10 (“Data and data governance”), comma 2, point F “examination in view of possible biases that are likely [...] to discrimination prohibited under European Union Law” we think that data available to insurance companies in combination with black-boxes devices (that are optional) could be exploited to produce future biases. In fact, knowing the driving style thanks to the black box (e.g. mean speed, position, gear shifting, acceleration and deceleration), or knowing the age, location and insurance history of the person thanks to data available to the companies could lead to biased predictions. The systems could suggest as guilty people with a lower age, worse insurance history or driving style without actually taking fully into consideration the incident dynamics.

This problem is correlated with Art. 14 (“Human oversight”): the AI system can suggest an answer, but it has to be endorsed by an insurance expert and its manual verification, in any case, must not be substituted with the AI system. To do a correct

analysis, as the Art. 13 (“Transparency”) states, the output must be interpretable and explicable to the human that is overseeing the system to make him able to refute or to change the suggestions made by the machine. This objective is also achieved with the fulfilling of Art. 11 (“Technical documentation”) and insurance experts will have to read such documentation to be able to interpret the data and comprehend the correct functioning of the system. Art. 12 (“Record-keeping”) instructs for the automatic recording of the system's events. In the case of insurance companies, record-keeping and explicability are essential in a more concrete way: being not able to recall what case and to correctly explain the decisions made could lead the parts to fulfill the right to ask for compensation.

Is also important to take into account the different duties for the coinvolted actors (providers, importers, distributors, deployers, and users). Starting from the Art. 16, point A, the providers shall “ensure that their high-risk AI systems are compliant with the requirements set out in Section 2” (so all the obligations of a high risk system).

Art. 23 says that the importers shall ensure that imported AI systems conform to the regulation and that providers have conducted appropriate conformity assessment procedures.

The distributors shall verify that AI systems comply with the regulation and are accompanied by the required documentation (Art. 24).

Deployers shall take appropriate technical and organisational measures to ensure they use

such systems in accordance with the instructions for use accompanying the systems (Art. 26).

Finally the Users shall use the AI systems in accordance with the instructions for use and monitoring their performance (Art. 29).

Ethical Aspects

The ethical implications of this AI system are largely intertwined with the legal considerations outlined in the preceding paragraph.

During the training phase of this AI system, historical data on drivers is taken into account, which may contain biases that reflect prejudices about society. The overrepresentation of certain demographic groups in past accidents, as well as gender and age, could lead to inaccurate predictions and affect the estimated fault probabilities.

It is also important to consider the transparency and accountability of the system. This type of model functions as a "black box", making it essentially impossible to comprehend the underlying decision-making process. It is essential that those involved in this AI system have access to information regarding the decision-making process. Therefore, a lack of transparency could result in a loss of trust in the system.

The system draws on a range of data sources, including accident photos and driver histories, which may give rise to privacy and data protection concerns. The collection and processing of this information may give rise to concerns about potential surveillance and misuse of personal data. It is essential that individuals are informed about the data being

collected and how it will be used. Obtaining explicit consent and allowing individuals to control their data are critical operations in order to respect privacy rights.

It is also important to consider the accountability of this system. In the event that the AI system makes an incorrect fault assignment, determining who is responsible (the developers, operators, or the AI itself) can be complex. For this reason, it would be beneficial to have human experts oversee the AI system outcomes.

Finally, it is essential to ensure that the system does not lead to unintended negative consequences.

Proposed Solution

In order to mitigate the risk associated with the proposed system, it would be prudent to consider the stipulations outlined in Art. 6, comma 3, point D. This stipulation indicates that if the system is utilised for a preparatory task, the risk classification may be reclassified from high to minimal. The AI system can be used to conduct a preliminary 3D simulation and generate a report. However, the report must be based on objective data, such as mean speed or whether a vehicle passed through a red light. In any case, the system must not be used to suggest the guilt of a person, and the decision must be made by a human insurance expert. This is because the AI system is not influencing the human analysis of the accident; it is simply being used to reconstruct the dynamics of the incident to provide further clarity for an expert to analyse and judge. This allows for an autonomous decision to be made by the human expert, with legal and professional responsibilities fully borne by them.

Conclusions

AI offers promising advancements in claims management, but its implementation demands rigorous legal and ethical scrutiny. The proposed system is classified as high-risk under the AI Act and must be subject to comprehensive safeguards, including robust data governance, strict human oversight, and a commitment to transparency. The most effective approach is to view AI as an analytical tool that augments rather than replaces human expertise.

Bibliography

- <https://eur-lex.europa.eu/eli/reg/2024/1689/oj>
- https://ntplusdiritto.ilsole24ore.com/art/ai-act-pratiche-vietate-e-regole-i-sistemi-ad-alto-rischio-segno-trasparenza-e-sicurezza-AFH5Quv?refresh_ce=1
- <https://www.ilsole24ore.com/art/ai-act-s-catta-conto-rovescia-adeguamento-che-devono-sapere-e-fare-aziende-AFrZPP1C>
- <https://link.springer.com/article/10.1007/s43681-024-00591-7>
- <https://link.springer.com/article/10.1007/s43681-024-00592-6>
- <https://www.bitmat.it/news/ai-act-entrano-in-vigore-le-restrizioni-sui-sistemi-di-ai-vietati/>
- <https://www.consilium.europa.eu/en/policies/artificial-intelligence/>
- https://ec.europa.eu/commission/press-corner/api/files/document/print/it/qanda_22_5793
- <https://tech-stack.com/blog/ai-in-transportation/>